

REMARKS

The pending claims are claims 1, 2, and 4-17.

Claim Rejection - Double Patenting.

The PTO has rejected all pending claims for obviousness-type double patenting over U.S. Patent No. 6,596,816 (the '816 patent). Applicants respond that they submit herewith a Terminal Disclaimer relative to the '816 patent. Consequently, Applicants respectfully request withdrawal of this rejection.

Presumed Rejection Over Quednau and Efka Chemicals

The Final Action is unclear as to whether or not the PTO has maintained its rejection in view of Quednau, U.S. Patent No. 5,688,858 and Efka Chemicals, EP311 157. Although the PTO states that Applicants' arguments have been considered but are not persuasive, the PTO has not stated that the 35 USC §102b rejection made in the Action of February 22, 2007 stands. Nevertheless, Applicants will treat the Action as if the PTO has maintained the §102b rejection.

The PTO's two criticisms of Applicants' July 20, 2007 response to the §102b rejection are as follows:

1. Applicants comments about example 4 of Quednau relative to Efka Chemicals example 4;
2. Applicants' reliance upon "Advanced Organic Chemistry" By March.

Regarding criticism 1, the PTO states that:

"Applicants comment regarding a difference between example 4 of Quednau et al, US 5,688,858 and Efka Chemical BV, EP 311 157 is confusing since the references recite example 4 identically word for word. While example 4 does not use isobornyl methacrylate as asserted by applicant, preceding example 3 and the following example 5 do set for the isobornyl methacrylate."

Action of October 9, 2007, pages 2 and 3.

Applicants reply that the A1 and B2 versions of example 4 of EP 311 157 differ. These versions are attached as an exhibit to this Response. While the EP A1 version of example 4 corresponds to the text of example 4 of the Quednau US patent, the EP B2 version does not. Those versions read as follows.

“Example 4 of USP 5,688,858

In the manner described in Example 1 a polymerization of 3.78 g vinyl toluene, 5.69 g isobutyl methacrylate, 7.38 g 2-ethyl hexyl methacrylate, 7.97 g stearyl methacrylate, 4.55 g glycidyl methacrylate and 0.59 g ditertiary butylperoxide were effected in 14.98 g xylene and 4.99 g methoxypropyl acetate.

At the end of the polymerization 24.97 g butylacetate were added, and 4.01 g 1-(3-aminopropyl)imidazole were added to the polymer.”

‘858 patent at col. 7, lines 9-20

“Example 4 of EP 311 157 A1

In the manner described in Example 1 a polymerization of 3.78 g vinyl toluene, 5.69 g isobutyl methacrylate, 7.38 g 2-ethyl hexyl methacrylate, 7.97 g stearyl methacrylate, 4.55 g glycidyl methacrylate and 0.59 g ditertiary butylperoxide was effected in 14.98 g xylene and 4.99 g methoxypropyl acetate.

At the end of the polymerization 24.97 g butylacetate were added, and 4.01 g 1-(3-aminopropyl)imidazole were added to the polymer.”

A-1 version of EP 0311157 page 7.

“Example 4 of EP 311 157 B2

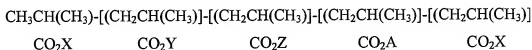
In 47.00 g toluene and 15.67 g n-butanol, 29.97 g isobornyl methacrylate, 9.36 g styrene, 38.71 g 2-ethyl hexyl acrylate, 14.12 g vinyl imidazole and 11.85 g tertiary butyl perbenzoate were polymerized. At the end of the polymerization a polymer solution was obtained having a solid content of 60% by weight.”

B2 version of EP 0 311 157 page 5.

Applicants apologize for this confusion.

In any event, Applicants' October 9th argument was based upon the text of example 4 provided in the US patent, the '858 patent. That argument brings us to the second criticism, that the citation to March did not support Applicants' argument.

Applicants argued that Example 4 of the '858 patent/EPA1 disclosed preparation of a vinyl polymer containing pendant ester and epoxy groups. The pendant ester groups (ester side chains) come from isobutyl methacrylate, 2-ethyl hexyl methacrylate and stearyl methacrylate. The pendant epoxy groups come from glycidyl methacrylate. This polymer would have the formula:



wherein X is an isobutyl group, Y is a 2-ethyl hexyl group, Z is a stearyl group and A is a CH₂-CH-CH₂- group (a glycidyl carboxy group).

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Applicants explained that the addition of 1-(3-aminopropyl)-imidazole with this polymer resulted in the reaction of the amine group of the imidazole with the glycidyl side chain (epoxy side chain) not the ester side chains. Applicants pointed out that the 1:1 stoichiometric ratio of amine groups to glycidyl group meant that no excess amine group would remain to react with ester. To show that amines preferentially react with glycidyl groups rather than ester groups, Applicants cited the March Treatise. Applicants also cited the text of the '858 patent itself as providing support for the preferential reaction of amines with glycidyl groups as opposed to ester groups.

The PTO criticized this support as not being adequate.

Therefore, Applicants submit further support to show that amines preferentially react with glycidyl groups in the presence of ester groups. That support is provided by the attached abstracts from:

- 1) J. Org. Chem., USSR 8, 1368-1373 (1972);

- 2) Bull Acad. Sci., USSR Div. Chem. Sci. 38, 4, 789-792 (1989);
- 3) Eur. J. Med Chem., Chim. Ther , 29, 3, 241-244 (1994);
- 4) Collect. Czech. Chem. Commun., 43, 1694-1704 (1976);
- 5) J. Med. Chem. 27, 1007-1016 (1984).

All of these scientific publications show the reaction of a primary amine with an epoxy group (glycidyl group) in the presence of ester groups. The ester groups are unreactive. For reference, a copy of the complete J. Med. Chem. publication is attached. See Scheme III and the descriptions of the syntheses of the following compounds in the Experimental Section, 2,3-Epoxypropyl Benzoate 9 and 3-(Isopropylamino)-2-hydroxylpropyl Benzoate hydrochloride 14. In addition, support is provided by J. Med. Chem., 20, 394-397 (1977), complete copy attached. See the reaction of 20 with N-benzyl-N-methyl amine to yield compound 21.

This information demonstrates the truth of Applicants' statement about example 4 of the '858 patent. The amine group of aminopropyl imidazole reacts with the pendant glycidyl group of the polyolefin, not the pendent ester groups. Moreover, the '858 patent confirms this statement as Applicants discussed in their previous amendment. At col. 3, lines 46-63, the '858 patent discloses that the amine or hydroxy compounds to be combined with the subject polymer react with either an epoxy group or an isocyanate group depending on which is present in the polymer. This reaction occurs in the presence of ester groups.

In contrast, Applicants form amides from pendant ester groups of a polyacrylic ester by reacting those pendant ester groups with a primary amine so as to convert from 1% to 50% of the pendant ester groups to pendant amide groups. As indicated at page 5, lines 17-22 of Applicants' specification, this aminolysis is accomplished through use of an acidic catalyst at elevated temperature.

Thus, example 4 of the '858 patent does not disclose the post polymerization conversion of side chain ester groups to amide groups as is required by Applicants' claims. Applicants submit, therefore, that the '858 patent generally and its example 4 in particular do not teach or suggest

Applicants' polymer with its designated amide side chains. The polymer of example 4 of the '858 patent does not contain amide side chains but rather contains unreacted ester side chains and hydroxyl amine side chains formed by the reaction of the aminopropyl imidazole and the glycidyl side chains.

For these reasons, Applicants submit that their claims are patentable over the Efka EP document and over the '858 patent. Applicants respectfully request that the rejection be withdrawn.

Conclusion

Applicants respectfully submit that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney 612-373-6939 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,
Karlheinz Haubenestel et al
By his Representatives,
SCHWEGMAN, LUNDBERG, WOESSNER P.A.
P.O. Box 2938
Minneapolis, MN 55402
612-373-6939

Date: April 4, 2008

By


Arlin James Nelson

Reg. No. 28,650

CERTIFICATE UNDER 37 CFR § 1.8: The undersigned hereby certifies that this correspondence is being filed using the USPTO's electronic filing system EFS-Web, and is addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 4th day of April 2008.

Name: PATRICIA A. HULTMAN

Signature: 